Unit 6: electrochemistry

6.1 Redox processes: electron transfer and changes in oxidation number (oxidation state)

Redox reaction:
Oxidation: gain of oxygen, loss of electrons, increase in oxidation number
Reduction: loss of oxygen, gain of electrons, decrease in oxidation number
Disproportionation reaction: reaction where the same substance gets both oxidized and reduced
Oxidizing agent: substance which brings about oxidation by removing electrons from another molecule, so it itself gets reduced, examples include oxygen, hydrogen, $KMnO_4$, $K_2Cr_2O_7$
Reducing agent: substance which brings about reduction by donating electrons to another molecule so it itself gets oxidized, examples include metals, KI, $LiAlH_4$, $NaHBr_4$

Oxidation number rules:
Any uncombined atom → 0
Monoatomic ions → their charge
elements in compound ions → overall is their charge, the more electronegative atom has a negative oxidation number
If roman numerals are present → the roman numerals
Hydrogen with non-metals → +1
Hydrogen with metals in metal hydrides → -1
Oxygen most of the time → -2
Oxygen in peroxides → -1
Oxygen with fluorine → +2

Extra page for pastpapers notes